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Regional Integration and Natural Resources Who Benefits

Evidence from MENA

Céline Carrère
Julien Gourdon
Marcelo Olarreaga

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Abstract

This paper builds on theoretical predictions that show that gains from regional integration are unevenly distributed between resource rich and poor countries. It explores the effects of different integration schemes in the Middle East and North Africa. The results suggest that within the Pan Arab Free Trade Agreement, there is significant trade creation for resource poor countries associated with regional integration, and no evidence of trade diversion. In resource rich countries, however, there is evidence of pure trade diversion in both resource-rich/labor-abundant countries and resource-rich/labor-importing countries. This underscores the idea that regional integration can help to spread the benefits of unevenly distributed resource wealth among the region's economies.

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Regional Integration and Natural Resources: Who Benefits? Evidence from MENA*

Céline Carrère*
Julien Gourdon**
Marcelo Olarreaga***

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* European Institute, University of Geneva, email: celine.carrere@unige.ch
**The World Bank and CEPII, Paris, email: jgourdon@worldbank.org and julien.gourdon@cepii.fr
*** Economics Department, University of Geneva and CEPR, email: marcelo.olarreaga@unige.ch.

1. Introduction

Non-renewable natural resources account for some 15% of world trade. A very high proportion of the output of the sector is traded internationally (more than two-thirds of oil output is traded) and many resource producers are almost totally dependent on resource exports for their foreign exchange. The characteristics of these countries raise issues for the analysis of regional economic integration within regions with such countries. They have little chance of following a manufacturing export path to economic development and resources abundance ensures a flow of foreign exchange in the region. Conversely their resource poor neighbors are critically short of foreign exchange and would benefit from those markets to expand and diversify their manufacturing sector. These circumstances make it natural to think that regional integration might be particularly valuable.

However, for trade in natural resources, the issue of trade creation and trade diversion is somewhat different, even unique. This is because, relative to manufactured goods, tariff and non-tariff barriers on natural resource commodities such as oil, natural gas, metals and minerals tend to be low (Carbaugh, 2007). Hence, an analysis of potential trade creation and trade diversion effects when two resource-abundant countries enter into a preferential trade agreement will be a function of the extent of specialization – whether both have complete specialization in the production and export of resource-intensive goods, or whether the relatively resource-poor country has a small, developing manufacturing sector as well.

In a recent theoretical paper Venables (2011) argues that we are likely to observe some degree of trade diversion when a resource rich country enters into a preferential trade agreement with a relatively labor abundant country. In such a situation, the preferential agreement will create incentives for labor-intensive goods to be sourced from the resource poor country. This will help the resource poor country extend its regional exports and reach a higher level of economic growth. But

this will be achieved at the expense of the resource rich country, which will experience trade diversion, as it substitutes imports from the relatively more efficient rest of the world towards the regional partner.

In order to empirically address these questions we explore the extent to which Middle East and North Africa (MENA) different integration schemes have led to trade creation and trade diversion. Half a century after the creation of the Arab League in 1945 aiming at intensifying regional trade in the region,[1] MENA's spaghetti bowl of regional integration agreements has little to envy compared with those in Latin America or Sub-Saharan Africa (World Bank, 2008).[2] However, in spite of the numerous regional trade agreements, the extent of intra-regional trade is only a tenth of total trade, and is below what a standard gravity model (which explains bilateral trade using distance between partners and the economic size of the two partners) would predict (Miniesy et al., 2004 or Péridy, 2007).

Regardless of whether MENA's intra-regional trade remains too small, this paper explores the extent to which regional trade agreements have contributed to intra-regional trade, and whether this has entailed trade diversion, and therefore broader economic efficiency.

We put forward standard panel gravity model where aggregate imports of MENA countries are explained using bilateral fixed effects and year-specific importer and exporter fixed effects. These fixed effects control, among other things, for the traditional determinants of a gravity equation, such as distance, colonial links, common language, as well as GDP, population, MFN tariffs of the exporter and the importer and unobservable trade costs/price indices (see Anderson and Van Wincoop 2003) .

[1] Clause 2 of the protocol reads : « the Arab States…shall closely cooperate in…commercial exchange, customs…" and in 1982 an agreement was reached for the development of intra-regional trade (Decree 848 of 27/2/1982.

[2] A list of these often overlapping agreements is given in the Appendix.

We then introduce different types of dummies to capture the impact of the creation of trade agreements on intra-regional imports and imports from the rest-of-the world as in Carrère (2006). The coefficient on the variable capturing the impact on intra-regional imports measures the extent of trade creation (in the Lipsey (1957), rather than Viner (1950) sense[3]), and the coefficient on the variable capturing the impact on imports from the rest-of-the-world measures the extent of trade diversion (again, in the Lipsey sense).

Results of our basic specification suggest that there is trade creation in most agreements, and that trade diversion may only be a problem in the Pan-Arab Free Trade Area (PAFTA), in particular when considering non-oil imports.[4] As predicted by Venables (2011) trade diversion seems to be concentrated in resource rich importers. These are generally countries that export only a few products and with a highly concentrated export bundle. Interestingly, these countries have also significantly increased their exports of non-oil goods to resource poor countries, but these increases were not accompanied by trade diversion in resource poor countries.

Thus, MENA regional integration has been mainly trade creating, and both resource poor and resource rich countries have seen increases in their exports of non-oil goods to the region. Trade diversion was observed only in resource rich countries, suggesting that MENA's preferential agreements were associated with spreading benefits of unevenly distributed resource wealth among the region's economies.

Section 2 presents Venables (2011) analytical setup with predictions on the extent of trade diversion and trade creation when regional integration takes place between

[3] Trade creation in the Viner sense occurs only when the regional partner is the lowest cost supplier. This is not necessary to observe trade creation according to Lipsey's definition which will be observed whenever intra-regional trade increases conditional on not displacing imports from the rest-of-the-world. Thus, trade creation in the Viner sense is a sufficient but not necessary condition to observe trade creation in the Lipsey sense.

[4] As can be seen in the Appendix PAFTA was signed in 1996 and entered into force in 1998. It was signed by Bahrain, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Qatar, Saudi Arabia, Syria, Tunisia, United Arab Emirates and Yemen.

resource poor and resource rich countries. Section 3 presents the empirical model applied to MENA, and section 4 discusses data sources and variable construction. Section 5 presents the empirical results and section 6 concludes.

2. Trade agreements between resource poor and resource rich countries: An analytical setup[5]

Let us assume a three-country world with two countries which are natural resource abundant and form a preferential trade agreement. One should expect little trade creation from such an agreement if the two countries have a comparative advantage in the same natural resource. Indeed, there is no reason for these countries to trade and therefore little trade creation or trade diversion should be expected from such an agreement. On the other hand if the countries are abundant in different natural resources, then trade creation can be expected, and this will be accompanied of little trade diversion. Thus, the first prediction for regional integration among natural resource abundant countries is that this should be accompanied of no trade diversion and mild levels of trade creation.

If the preferential trade agreement on the other hand is signed by a natural resource abundant country and a natural resource poor country with a small but developing manufacturing sector, then the introduction of tariff preferences will probably lead to some trade creation in the resource poor country, as it will be able to import more natural resources from the resource rich country[6]. There is little scope for the resource poor country to suffer from trade diversion if the resource abundant country is specialized in the natural resource good. On the other hand, the resource rich country may suffer from a significant amount of trade diversion as the resource poor country benefiting from the preferential access can increase its exports to the

[5] This section draws heavily from Venables (2011) and WTO (2010).
[6] As surprising as it could appear, resource poor countries in MENA for instance applied tariffs (13 percent) on imports of resources commodities such as oil from resource abundant countries of the region (GCC) before PAFTA implementation. See the Appendix.

resource rich country of manufacturing goods, while continuing to exports natural resource intensive goods to the rest of the world.

As suggested by Fouquin et al (2006) and Venables (2011) this explains why resource rich countries have not been a driver of regional integration schemes in the developing world. Such schemes would imply income redistribution from resource rich countries to resource poor countries. Indeed, preferential access allows producers in resource-poor countries to benefit from higher prices in the resource-rich country. This increases producer surplus in the exporting resource-poor country, and reduces tariff revenue in the importing resource-rich country. So the resource-poor country is better-off, whereas the resource-rich country tends to be worse-off.[7]

Whether this is desirable for the region as a whole is an empirical question. In the pure-trade diverting case, where the increase in exports from the resource-poor country to the resource-rich country is accompanied by an equivalent decline in imports of the resource-rich country from the rest-of-the-world, the region will unambiguously be worse-off. Thus, a necessary condition for the region to be better off is that the increase in intra-regional trade is larger than the decline in trade with the rest-of-the-world.

This can be checked with our empirical model. We will first test the second prediction in Venables (2011) that suggests that when resource rich countries sign preferential trade agreements with resource poor countries, the former are more likely to suffer from trade diversion than the latter, and we will then checked whether in this case, the increase in exports from the resource-poor country to the resource-rich country is larger than the fall in the resource-rich country imports from the rest-of-the-world.

3. The empirical model for MENA

[7] Note that consumer prices may also decline in the resource-rich importing country if the supply of the resource-poor exporting country is sufficiently large, which may bring gains for the resource-rich importing country.

We follow a standard gravity equation approach to assess the extent of trade creation and diversion associated with MENA's preferential trade agreements. Bilateral imports of MENA countries with respect to each of its regional and non-regional partners are explained by a series of bilateral fixed effects that capture the effects of distance, colonial links and any other time-invariant characteristics of each bilateral pair, as well as year-specific importer and export fixed effects that capture the impact of the evolution of GDP, population, MFN tariffs or any other importer and year, or exporter and year characteristics. In particular, the importer-year and exporter-year fixed effects allows to avoid the bias that will be associated with the omission of exporter and importer remoteness terms (see Anderson and VanWincoop, 2003). More formally:

$$\ln M_{ijt} = \alpha_{ij} + \delta_{it} + \gamma_{jt} + \sum_k \phi_1^k \text{RTAintra}_{ijt}^k + \sum_k \phi_2^k \text{RTArow}_{ijt}^k + \nu_{ijt} \qquad (1)$$

where M_{ijt} are country i ($\in$MENA) import from j in year t, RTAintra_{ijt}^k = 1 if i and j belong to the same RTA *k* in t, otherwise 0 (intra-regional trade), and RTArow_{ijt}^k = 1 if i but not j belongs to the RTA *k* in t, otherwise 0. The coefficient of the first term $\left(\Phi_1^k\right)$ captures trade creation in the Lispey sense, and the second term $\left(\Phi_2^k\right)$ trade-diversion. α_{ij} are bilateral fixed effects, δ_{it} are the importer-year specific effects, and γ_{jt} are the exporter-year fixed effect. v_{ijt} is an i.i.d. error term.

The *k* agreements we explore include PAFTA, The Gulf Cooperation Council (GCC), AGADIR, COMESA (which also involves some Easter and Sub-Saharan African countries), all Euromed agreements signed by MENA countries, all FTAs with EFTA countries and all FTA with Turkey (for a list containing each of these agreements, see the appendix).

We then explore within the same gravity setup how patterns of trade creation and trade diversion vary across bilateral pairs depending on whether there are resource rich or resource poor. This could be done only for PAFTA as this is the only trade agreement within MENA involving both resource rich and resource poor countries.[8] PAFTA is also one of the well-functioning regional trade agreements in MENA. Indeed as argued by Hoekman and Zarrouk (2009), intra-PAFTA trade barriers have substantially come down since the entry into force of the agreement.[9] The gravity equation becomes:

$$\begin{aligned}\ln M_{ijt} = \alpha_{ij} + \delta_{it} + \gamma_{jt} &+ \beta_1 \left[RR_i.RR_j.PAFTA\text{intra}_{ijt} \right] + \beta_2 \left[RR_i.RP_j.PAFTA\text{intra}_{ijt} \right] \\ &+ \beta_3 \left[RP_i.RP_j.PAFTA\text{intra}_{ijt} \right] + \beta_4 \left[RP_i.RR_j.PAFTA\text{intra}_{ijt} \right] \\ &+ \beta_5 \left[RR_i.PAFTArow_{ijt} \right] + \beta_6 \left[RP_i.PAFTArow_{ijt} \right] \\ &+ \sum\nolimits_k \phi_1^k \text{RTAintra}_{ijt}^k + \sum\nolimits_k \phi_2^k \text{RTArow}_{ijt}^k + \nu_{ijt}\end{aligned} \quad (2)$$

where RR and RP capture whether the importer or the exporter is considered as a resource rich or resource poor country respectively. As before RTAintra_{ijt}^k = 1 if i and j belong to the same RTA *k* in t, otherwise 0, and RTArow_{ijt}^k = 1 if i but not j belongs to the RTA *k* in t, otherwise 0. The intra variables of PAFTA are then interacted with RR_i and RP_i, as well as RR_j and RP_j to explore the degree of heterogeneity on trade creation within MENA depending on whether the importer and exporter are resource rich or poor. Then β_1 captures trade creation between rich resource countries in PAFTA; β_2 when the importer is resource rich and the exporter is resource poor within PAFTA; β_3 when both PAFTA countries are resource poor, and β_4 when the importer is resource poor, but the exporter is resource rich within PAFTA.

[8] According to World Bank's classification resource poor countries in PAFTA include Tunisia, Morocco, Lebanon, Jordan, Egypt, Sudan, West Bank of Gaza and Djibouti. Resource rich countries can be divided into two sub-categories. GCC Oil exporters include UAE, Saudi Arabia, Qatar, Oman, Kuwait and Bahrain. Developing Oil Exporters include: Yemen, Syria, Iran, Iraq, Libya and Algeria.

[9] Although as argued by them and Chauffour (2011) there is still some important work left in terms of non-tariff barriers.

The specification in (2) also allows for heterogeneity in trade diversion within PAFTA depending on whether the importer or the exporter are resource rich or poor. β_5 captures the extent of trade diversion if the PAFTA importer is resource rich, and β_6 when the PAFTA importer is resource poor.

Because within PAFTA we can further distinguish between resource rich labor abundant (i.e. developing oil exporter) and resource rich labor importing (i.e. GCC oil exporter) countries, we also explored the heterogeneity in trade creation and diversion after this further decomposition.

Finally, and partly because these categories are pre-determined by the World Bank, we test the robustness of our results to the use of alternative to the resource poor and resource rich categories of the World Bank. We then introduce a variable capturing the degree of export concentration of the exporter and the importer. The rationale is that countries that are relatively abundant in natural resources will tend to have a more concentrated export bundle, whereas countries less abundant in natural resources will have a more diversified export bundle. This will lead to effects similar to the ones described in Venables (2011) with more concentrated countries suffering from trade diversion and more diversified countries benefitting from trade diversion to its more concentrated partners. As proxies for the degree of concentration of the export bundle we use the Herfindhal index of export concentration, and the number of exported goods at the six digit of the Harmonized System average over the three year period preceding the entrance in force of the PAFTA agreement. The estimated gravity equation then becomes:

$$\begin{aligned}\ln M_{ijt} = \alpha_{ij} + \delta_{it} + \gamma_{jt} + \lambda_1 \left[PAFTA\text{intra}_{ijt} \right] + \lambda_2 \left[\frac{CI_{jt_0}^{\text{export}}}{CI_{it_0}^{\text{export}}} . PAFTA\text{intra}_{ijt} \right] \\ + \lambda_3 PAFTArow_{ijt} + \lambda_4 \left[CI_{it_0}^{\text{export}} . PAFTArow_{ijt} \right] \\ + \sum_k \phi_1^k \text{RTAintra}_{ijt}^k + \sum_k \phi_2^k \text{RTArow}_{ijt}^k + \nu_{ijt}\end{aligned} \quad (3)$$

Where CI_{jt_0} is a measure of the exporter's export bundle concentration (Herfindhal index or number of lines exported) in year t_0, with t_0 being an average over the 3 years preceding the entry of country j in the agreement. When the *CI* is indexed *i* it captures the concentration of the export bundle of the importer in the 3 year previous to the signing of the agreement. Thus, λ_2 captures the extent to which one could expect a strongest degree of trade creation when the exporter is relatively more concentrated than the importer (if $\lambda_2 > 0$). And λ_4 captures whether trade diversion is expected to be larger (if $\lambda_4 < 0$) when the importer has a highly concentrated production structure.

Finally, it is worth noting that because all specifications imply controlling for a very large number of dummy variables, we decided for computational reasons not to introduce thousands of fixed effects, but to compute deviations from the mean for each of these variables. Because, there are several dimensions in our fixed effects (bilateral, importer-year and exporter-year), the calculation of the deviations to the mean is not straightforward. Each variable was transformed as follows:

$$\tilde{y}_{ijt} = \left[y_{ijt} - y_{ij.} - y_{i.t} - y_{.jt} + y_{i..} + y_{.j.} + y_{..t} - y_{...} \right] \qquad (4)$$

We then apply a simple OLS estimator to the transformed variables in each of the specifications in equations (1) to (3). To control for potential correlation of the error term within country pairs, we correct the standard errors for clustering within country pair.

4. Data and variable construction

Bilateral import data for 18 MENA countries (all except Iraq and West Bank of Gaza) and 239 partners is from United Nation's Comtrade[10]. We use data for the period 1990-2009 (20 years) as in the 1980s MENA regionalism was non-existent. Data for Libya is mirrored because Libya does not report to the United Nations system. These differences in data sources for Libya are partly controlled for in our empirical specification by the importer-year and exporter-year fixed effects.

We use total import data, but also data on non-oil imports[11]. In a robustness check we also used data that subtract re-exports from bilateral import data[12], but the results are almost identical to those reported in the next section.

We use WTO notifications to capture the year of entry into force of the agreement[13], and these available in the appendix. As already mentioned, we looks at the trade effects of PAFTA, The Gulf Cooperation Council (GCC), AGADIR, COMESA, all Euromed agreements signed by MENA countries, all FTAs with EFTA countries and all FTA with Turkey.[14] We decided not to include dummies for the FTA signed by some MENA countries and the US because these are too recent to meaningfully estimate their impact. We also do not control for the Economic Cooperation Organization (ECO) for three reasons. First, the only MENA country in ECO is Iran. Second, it starts in 1992 and therefore captures almost our entire time variation. Including ECO would request expanding the time-span. Third, and more importantly, it is well known that ECO has been suffering from serious implementation problems, and therefore not much should

[10] were obtained through the World Bank's web platform: WITS (World Integrated Trade Solution)
[11] We exclude HS27: Mineral fuels, oils & product of their distillation from total imports.
[12] Hence results are not driven by re-export from UAE which is classified a resource-rich country, and whose re-exports are indeed large. To check the sensitivity of our results to the presence of UAE, we took UAE from the sample, and re-estimated the regressions. None of the coefficients change sign or loses significance and none is statistically different from the ones currently reported in the paper.
[13] Since we take account of agreement solely after their entry in force we do not capture possible anticipation effect.
[14] Some of these agreements overlap and this is sometimes referred to as MENA's spaghetti's bowl. However, there are always differences between these agreements in terms of membership and timing which allow for the identification of their impact on trade flows. Note, however, that we focus in the paper on the RR and RP trade relationship, which is PAFTA's specific, as it is the only MENA trade agreement where both RR and RP countries are present.

be expected (Pomfret, 2007). Note, however, that the results reported in the next section are robust to the inclusion of ECO.

Of all the trade agreements we considered only one includes MENA countries that can be classified as resource poor and resource rich, and that is PAFTA. For a description of countries under each category, see footnote 8.

The Herfindhal indices of export concentration and the number of export lines at the six digit HS level are computed using HS 6 digit data from United Nation's Comtrade. They are measured before the entry in force of the agreement and are based on total export by product of each country to the world.

5. Empirical results

Table 1 reports the results of the estimation of equation (1) for seven preferential trade agreements involving MENA countries. Both intra and rest-of-the-world (row) effects are reported for each of the seven agreements. The first column reports results using total imports, whereas the second column reports results for non-oil imports. The first point to notice is that there are no statistically significant differences between the coefficients reported under the two columns for total imports and non-oil imports.

In all agreements except AGADIR (involving Egypt Jordan, Morocco and Tunisia) and GCC (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and United Arab Emirates) we found a positive, large and statistically significant coefficient on intra-regional trade. The fact that AGADIR and GCC do not find a statistically significant coefficient for intra-regional trade can be partly explained by the fact that all AGADIR and GCC countries are part of PAFTA and entered into force after PAFTA. So the advantages in terms of intra-regional liberalization that AGADIR and GCC offer may be limited.

More interestingly, the only agreement to show a negative and statistically significant coefficient for imports from the rest-of-the-world is PAFTA and for non-oil imports only. For all other trade agreements, the coefficient is either positive or statistically insignificant, suggesting that trade diversion is not an important problem.[15]

In the case of PAFTA the coefficient on non-fuel imports from the rest of the world is statistically significant at the 10 percent level (col. 2). It is much smaller than the coefficient on trade creation. Indeed, the estimated percentage increase in intra-regional trade due to PAFTA is around 195 percent $\left(e^{1.082} - 1 = 1.95\right)$.[16] The percentage decline in imports from the rest of the world is 18 percent. One has to be careful however with the basis on which these numbers are calculated. Intra-PAFTA imports are only 11 percent of PAFTA imports from the world. So an 18 percent decline on something that is almost 10 times larger is not too far off a 195 percent increase on something that is 11 times smaller. Thus, this seems to suggest that most of the increases in intra-regional trade within PAFTA are simply substituting for imports from the rest-of-the-world and could therefore be an important source of inefficiency.

If the increase in intra-PAFTA trade is fully compensated by a fall in PAFTA imports from the rest of the world, then it is clear that PAFTA was welfare reducing for the region.[17] And this is a hypothesis that the estimates for PAFTA in the second column of Table 1 cannot statistically reject.

In order to assess the degree to which trade diversion in PAFTA may be concentrated in resource rich countries, Table 2 reports results of the estimation of the specification

[15] A positive and statistically significant coefficient could be rationalized if goods imported from the region and from the rest-of-the-world are seen as complements by consumers, or producers of final goods.
[16] Because the left-hand-side variable (imports) is in logs and the right-hand-side variable is a dummy (trade agreement by different type of countries), then the percentage increase in imports is given by the exponential of the coefficient minus 1. All percentage changes discussed below are computed as discussed here.
[17] Indeed, this is the classic case of pure-trade diversion. Total consumption in the importing country does not change if the increase in intra-regional imports is compensated by an equal decline in imports from the rest-of-the-world. The only impact in the importing country is the loss of tariff revenue associated with imports from the regional partner. The exporting country receives that gross transfers, as its producers now receive a higher price, and produce more, but these additional goods are produced at a cost that is higher than the price at which these good could be purchased in world markets. Thus, the region as a whole is worse off.

in equation (2). Again, the first column reports results for total imports and the second column for non-oil imports only. Results are not statistically different from each other across columns. The intra-PAFTA trade creation is now disentangle into four possible categories: trade creation among resource rich countries in the first row; trade creation when the importer is resource rich and the exporter is resource poor in the second row; trade creation when the importer is resource poor and the exporter is resource rich in the third row; and finally trade creation among resource poor countries in the last row.

The coefficients on intra-PAFTA trade creation are all positive and statistically different from zero. They are not very different from each other, and when we perform the 6 possible test of equality among intra-PAFTA trade creation coefficients we found that only 2 reject the null hypothesis that they are equal. Those are the tests for $H_0 : RP_i - RR_j = RR_i - RP_j$, and for $H_0 : RP_i - RR_j = RP_i - RP_j$. Note however that we cannot reject a joint test of the six equalities simultaneously suggesting that the coefficients on intra-regional trade creation may not be statistically different from each other after all.

Interestingly the largest coefficients are found for imports of resource poor countries from resource rich countries. The coefficient when the importer is resource rich and the exporter is resource poor (the second row) is 0.84 and the coefficient when the importer is resource poor and the exporter is resource rich (the third row) is 1.40, and the difference is statistically significant as discussed above. This implies that intra-PAFTA trade when the importer is resource rich and the exporter is resource poor increased by 132 percent, whereas the increase in intra-PAFTA trade when the importer is resource poor and the exporter is resource rich increased by 305% . Thus the latter is more than two times larger.

The main prediction of Venables (2011) is that the resource rich countries are more likely to experience trade diversion. This prediction is supported by the data in MENA

with a decline in imports of non-oil imports from the rest-of-the world of around 38 percent in the case of resource rich PAFTA countries, and no trade diversion at all in the case of resource poor countries.

Table 3 reports results of the same specification as in Table 2, but where we further decompose resource rich countries into GCC oil exporters and developing oil exporters. There are no significant differences with the results reported in Table 3, as could be expected, but the decomposition is interesting by itself. The top panel reports results for total imports and the bottom panel for non-oil imports. Again there are no statistical differences between the coefficients in the two panels. The decomposition suggests that the main driver of the large trade creation coefficient in Table 3 for imports of resource poor countries from resource rich countries comes from imports of GCC countries.

The largest trade diversion effects are to be found in developing oil exporters, and not in GCC oil exporters, but the extent of trade creation in GCC is much smaller than in developing oil exporters. Thus, in GCC country, the increase in imports from other PAFTA countries is on average 107 percent, whereas the decline on imports from the rest of the world is estimated at 25 percent. Again this can be surprising but to assess the relative importance of these two decreases one also needs to consider the difference in the base. Given that initial imports from the rest of the world of non-oil imports are at least five times imports of non-oil imports from other PAFTA countries, this suggests again a fully trade-diverting PAFTA for GCC members.

In the case of developing oil exporters the percentage decline in imports from the rest of the world is actually much larger, around 35 percent for non-oil imports. But the average increase in intra-PAFTA trade is much larger too: around 479 percent. Given that non-oil imports from the rest of the world are 9 times imports from PAFTA at the beginning of the PAFTA's implementation, this implies that the increase in intra-

PAFTA trade is not fully compensated by the decline in imports from the world in the case of developing oil exporter PAFTA members.[18]

Resource poor PAFTA members experience no trade diversion, and quite significant trade creation. While the trade creation is not a prediction of the Venables (2011) model, the absence of trade diversion among resource poor PAFTA members was a prediction of that model.

In order to check whether our results regarding trade-diversion and trade-creation are sensitive to the use of pre-determined categories of countries (resource rich, resource poor, etc.), in Table (4) we report the results of the estimation of the specification in equation (3) where instead of using pre-determined categories of countries, we measure the extent of concentration in the export bundle of each country before the creation of PAFTA and interact that measure of concentration with the PAFTA variable. We use two measures of concentration of exports: a Herfindhal concentration index, and the number of HS 6 digit goods that the country exports. The latter being a measure of diversification rather than concentration, of course. Table (4) has four columns. The first two columns report results for total imports and non-fuel imports using the Herfindhal concentration index as a measure of concentration.

The last two columns report results for total imports and non-fuel imports using the number of HS 6 digit good that the country exports as a measure of the diversification of exports before PAFTA was signed. Again, the idea is simply to explore if there is some heterogeneity in trade creation and trade diversion when countries with different degrees of concentration in their export bundle sign a preferential trade agreement.

Results suggest very little heterogeneity in terms of trade creation with the coefficients on trade creation being all positive, statistically different from zero, but

[18] More precisely the 67% of the intra-regional trade increase are done at the expense of the rest of the world, allowing for one third of pure trade creation.

not statistically different from each other across the estimates in the four columns. The interaction of relative concentration of the importer and the exporter is not statistically different from zero. This suggests that there is little evidence of heterogeneity in terms of trade creation across country pairs with different relative degrees of export concentration.

However, there is some statistically significant heterogeneity in terms of trade diversion that is illustrated by the fact that all the coefficients in the fourth row of Table 4 are statistically significant but with opposite results between Herfindhal index and number of lines. More concentrated countries (as measured by a higher Herfindhal index, or a lower number of products exported) tend to suffer from a larger degree of trade diversion. It is difficult to interpret the size of the coefficients because the variables are multiplied by the Herfindhal index or the number of exported lines, but Figure 1 provides an idea of the size of trade-diversion for the different PAFTA countries as well as the standard error of the estimate for each country.

When we measure concentration using the Herfindhal index, Saudi Arabia, Kuwait, Oman, Libya, Yemen and United Arab Emirates all have levels of trade diversion that are statistically different from zero with an average decline in imports from the rest of the world above 20 percent. When we use the number of export lines as a measure of diversification of exports before the agreement was signed, Lebanon, Jordan, Bahrain, Oman, Kuwait, Qatar, Libya, Sudan and Yemen all have levels of trade diversion that are statistically different from zero with an average decline in imports from the rest of the world around 30 percent.[19]

Finally in order to understand which are the types of goods in which we observe trade creation and trade diversion in resource rich and resource poor countries, Figure 2

[19] In the case of the United Arab Emirates imports from the world seem to increase after the creation of PAFTA, when we use the number of export lines as a measure of diversification, but this could be partly explained by a large amount of re-exports in the United Arab Emirates.

reports the distribution of export growth by sector between resource rich countries in PAFTA and the rest of the world in the top panel, and between resource poor countries in PAFTA and the rest of the world in the bottom panel.

Interestingly the bottom panel suggest that exports of resource poor countries to GCC countries are not as well correlated with export of resource poor countries to the world as the exports of resource poor countries to developing oil exporters, or to other resource poor countries. This again, suggests that there could be some significant trade diversion taking place in GCC countries when importing form resource poor countries within PAFTA. The correlation between the distribution of export growth from resource rich countries to resource poor countries with export growth from resource rich countries to the world in the top panel is also quite strong, suggesting again that resource poor countries within PAFTA may not be subject to a significant amount of trade diversion.[20]

6. Conclusion

Regional integration is expected to promote intra-regional trade. However, a recent theoretical study by Venables (2011) suggests that when resource rich and resource poor countries give preferences to each other, the resource rich country is very likely to suffer from trade diversion.

In this paper we explore the extent to which MENA different integration schemes have led to trade creation and trade diversion. We found significant evidence of increases in intra-regional trade following the entry into force of most agreements, and evidence of trade diversion in only one agreement: PAFTA.

[20] In terms of which are the goods with the higher growth in exports of resource poor countries to other PAFTA countries these are Machinery and Equipment, Base Metals and Equipment. Rubber and plastics seem to dominate exports of resource rich countries to other PAFTA countries.

We then explore whether Venables (2011) prediction was verified in PAFTA and found that indeed the main source of trade-diversion in PAFTA was due to the replacement of imports of resource-rich countries from the rest of the world by imports of resource rich countries from other PAFTA members. Resource poor countries suffer no trade diversion.

Putting together these results it suggests that the main beneficiaries from PAFTA were resource poor countries that experience only trade creation and benefit from the trade diversion of resource rich countries at the expenses of the rest of the world. This suggests that PAFTA has helped redistribute income from resource rich countries to resource poor countries within PAFTA. It also explains why resource rich countries may be reluctant to deepen further this type of agreements. Indeed, there are certainly more efficient means of redistributing income to resource poor countries in the regional than through trade diversion. However non-economic objectives, such as reinforcement of the resource-rich country's hegemonic power, could be one reason why resource-rich countries enter this type of agreement.

References

Anderson, J. And E. VanWincoop, 2003. Gravity with gravitas: a solution to the border puzzle. *American Economic Review* 93(1): 170-192.

Abeidini, J. and N. Péridy, 2008. The Greater Arab Free Trade Area (GAFTA): An Estimation of the Trade Effects. *Journal of Economic Integration* 23(4): 848-872.

Cadot O., C. Carrere and V. Strauss-Khan, 2011. Export Diversification: what's behind the hump? *Review of Economics and Statistics*, forthcoming.

Carrère, C., 2006. Revisiting the Effects of Regional Trade Agreements on Trade Flows with Proper Specification of the Gravity Model. *European Economic Review* 50(2): 223-247.

Chauffour, J.P., 2011. Trade Integration as a Way Forward for the Arab World. Policy Research Working Paper 5581, The World Bank: Washington, DC.

Fouquin, M, R. Langhammer and R. Scweickert, 2006. Natural Resource Abundance and its Impact on Regional Integration: curse or blessing? Paper presented at the ELSNIT/Fundacao Getulio Vargas Conference in Sao Paulo.

Hoekman, B. and J. Zarrouk, 2009. Changes in Cross-Border Trade Costs in the Pan-Arab Free Trade Area, 2001–2008. Policy Research Working Paper 5031, The World Bank: Washington, DC.

Imbs, J. and R. Wacziarg, 2003. Stages of diversification. *American Economic Review* 93(1): 63-86.

Miniesy, R. S., J. B. Nugent, and T. M. Yousef. 2004. "Intra- regional Trade Integration in the Middle East: Past Performance and Future Potential." In *Trade Policy and Economic Integration in the Middle East and North Africa: Economic Boundaries in Flux*, ed. H. Hakimian and J. B. Nugent. London: Routledge.

Péridy, N., 2007. Toward a Pan-Arab Free Trade Area: Assessing Trade Potential Effects of the Agadir Agreement. The Developing Economies 43(3): 329-345.

Pomfret, R., 1997. The Economic Cooperation Organization: Current Status and Future Prospects. Europe-Asia Studies 49(4): 657-667.

Schiff, M., and L. A. Winters, 1998. Regional Integration as Diplomacy. *World Bank Economic Review* 12(2), pages 271-95,

Venables, A., 2011 'Economic integration in remote resource-rich regions' in *Costs and benefits of economic integration in Asia,* R. Barro and J. W. Lee (eds) Oxford University Press

World Bank, 2008. MENA Economic Developments and Prospects: Regional Integration and Global Competitiveness. The World Bank: Washington, DC.

World Trade Report, 2010. Trade in Natural Resources. World Trade Organization: Geneva.

Table 1.
Trade creation and Diversion for each agreement involving MENA countries, 1990-2009

		ln (Mijt)	
		Total imports	Non fuel imports
		(1)	(2)
PAFTA	intra	1.039 *** *0.17*	1.082 *** *0.17*
	row	-0.181 *0.12*	-0.195 * *0.12*
GCC	intra	0.166 *0.17*	0.260 *0.17*
	row	0.954 *** *0.12*	0.956 *** *0.12*
AGADIR	intra	-0.051 *0.24*	0.042 *0.23*
	row	-0.383 *0.22*	-0.247 *0.21*
COMESA	intra	0.532 *** *0.20*	0.522 ** *0.21*
	row	0.469 *** *0.12*	0.395 *** *0.12*
Euromed	intra	0.325 ** *0.15*	0.266 ** *0.15*
	row	0.102 *0.14*	0.041 *0.14*
FTA with EFTA	intra	0.535 ** *0.24*	0.570 ** *0.24*
	row	0.237 *0.19*	0.218 *0.19*
FTA with TUR	intra	0.619 *** *0.30*	0.512 * *0.29*
	row	0.226 *0.22*	0.073 *0.21*
Observations		31,054	31,016
Nbers of importers a/		18	18
Nbers of exporters		239	239
Years		1990-2009	1990-2009
Fixed effects (ij)		Yes	Yes
Fixed effects (it)		Yes	Yes
Fixed effects (jt)		Yes	Yes

Notes: estimation with OLS; standard errors in italic: heteroscedasticity consistent and adjusted for country-pair clustering; * : p=0.1, **: p=0.05, ***: p=0.01
a/ only MENA countries, mirror data for Libya, no data for Iraq and West Bank of Gaza

Table 2.
Decomposition of intra-PAFTA Trade Creation and Diversion according to the natural resources endowment, 1990-2009

		ln (Mijt)			
		Total imports		Non fuel imports	
		(1)		(2)	
PAFTA	intra				
	RRi-RRj	1.09 ***	*0.24*	1.21 ***	*0.23*
	RRi-RPj	0.80 ***	*0.20*	0.84 ***	*0.21*
	RPi-RRj	1.45 ***	*0.26*	1.40 ***	*0.24*
	RPi-RPj	0.79 ***	*0.23*	0.91 ***	*0.23*
	row				
	RRi	-0.29 ***	*0.13*	-0.32 ***	0.13
	RPi	0.005	*0.15*	0.01	0.15
Observations		31,054		31,016	
Nbers of importers a/		18		18	
Nbers of exporters		239		239	
Years		1990-2009		1990-2009	
Fixed effects (ij)		Yes		Yes	
Fixed effects (it)		Yes		Yes	
Fixed effects (jt)		Yes		Yes	

Notes: all regressions include, in addition to PAFTA, all others agreements dummies also introduced in table1 but coefficients are not reported in order to save space. Estimation with OLS; standard errors in italic: heteroscedasticity consistent and adjusted for country-pair clustering; * : p=0.1, **: p=0.05, ***: p=0.01

a/ only MENA countries, mirror data for Libya, no data for Iraq and West Bank of Gaza

Table 3.
Decomposition of intra-PAFTA Trade Creation and Diversion according to the natural resources and labor endowment, 1990-2009

Total Imports	Importer					
Exporter	RPLA		RRLA		RRLI	
RPLA	0.66	*0.26* **	1.78	*0.65* ***	0.25	*0.22* **
RRLA	0.75	*0.37* **	0.17	*1.23*	0.38	*0.46*
RRLI	1.54	*0.24* ***	2.81	*0.61* ***	0.26	*0.29* ***
RoW	0.01	*0.12*	-0.41	*0.20* **	-0.26	*0.11* **

Non-oil Imports	Importer					
Exporter	RPLA		RRLA		RRLI	
RPLA	0.78	*0.26* ***	1.91	*0.65* ***	0.53	*0.24* **
RRLA	0.76	*0.36* **	1.73	*1.22*	0.77	*0.37* **
RRLI	1.48	*0.24* ***	1.62	*0.61* **	0.89	*0.25* ***
RoW	0.03	*0.12*	-0.43	*0.20* **	-0.29	*0.11* ***

Notes: all regressions include, in addition to PAFTA, all others agreements dummies also introduced in table1 but coefficients are not reported in order to save space. Estimation with OLS; standard errors in italic: heteroscedasticity consistent and adjusted for country-pair clustering; * : p=0.1, **: p=0.05, ***: p=0.01

RRLA stands for resource rich labor abundant (i.e. developing oil exporter) countries, RRLI and resource rich labor importing (i.e. GCC oil exporter) countries and RPLA resource poor labor abundant countries.

a/ only MENA countries, mirror data for Libya, no data for Iraq and West Bank of Gaza

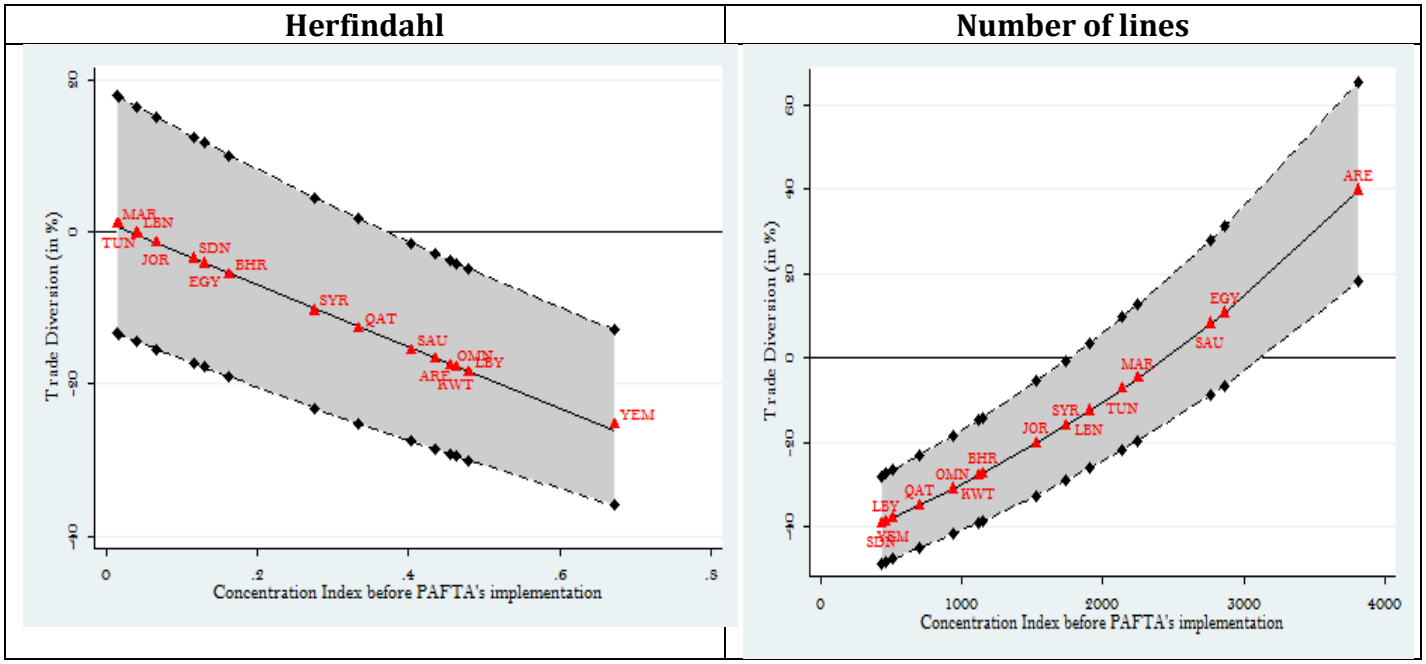
Table 4.
Decomposition of intra-PAFTA Trade Creation and Diversion according to the natural resources and labor endowment, 1990-2009

		ln (Mijt)			
		Total imports	Non fuel imports	Total imports	Non fuel imports
		(1)	(2)	(1)	(2)
PAFTA	intra	1.051 *** *0.18*	1.083 *** *0.17*	1.186 *** *0.20*	1.247 *** *0.20*
	CIj/CIi.intra	0.009 *0.01*	0.013 *0.01*	-0.009 *0.06*	-0.028 *0.06*
	row	-0.005 *0.15*	0.017 *0.14*	-0.656 *** *0.15*	-0.647 *** *0.15*
	CIi.row	-0.383 ** *0.18*	-0.461 *** *0.18*	0.0003 *** *0.00*	0.000 *** *0.00*
CI		*Herfindahl*	*Herfindahl*	*Number of lines*	*Number of lines*
Observations		31,054	31,016	31,054	31,016
Nbers of importers a/		18	18	18	18
Nbers of exporters		239	239	239	239
Years		1990-2009	1990-2009	1990-2009	1990-2009
Fixed effects (ij)		Yes	Yes	Yes	Yes
Fixed effects (it)		Yes	Yes	Yes	Yes
Fixed effects (jt)		Yes	Yes	Yes	Yes

Notes: all regressions include, in addition to PAFTA, all others agreements dummies also introduced in table 1 but coefficients are not reported in order to save space. Estimation with OLS; standard errors in italic: heteroscedasticity consistent and adjusted for country-pair clustering; * : p=0.1, **: p=0.05, ***: p=0.01

a/ only MENA countries, mirror data for Libya, no data for Iraq and West Bank of Gaza

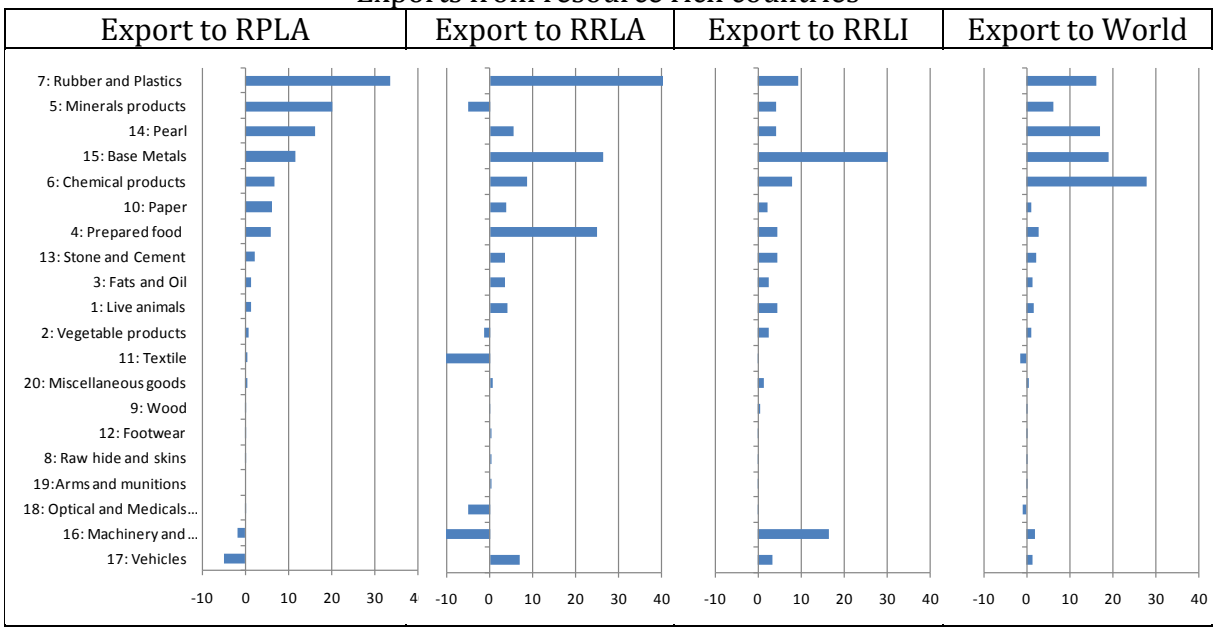
Figure 1
Predicted non-fuel trade diversion by MENA countries given the pre-PAFTA Concentration index value



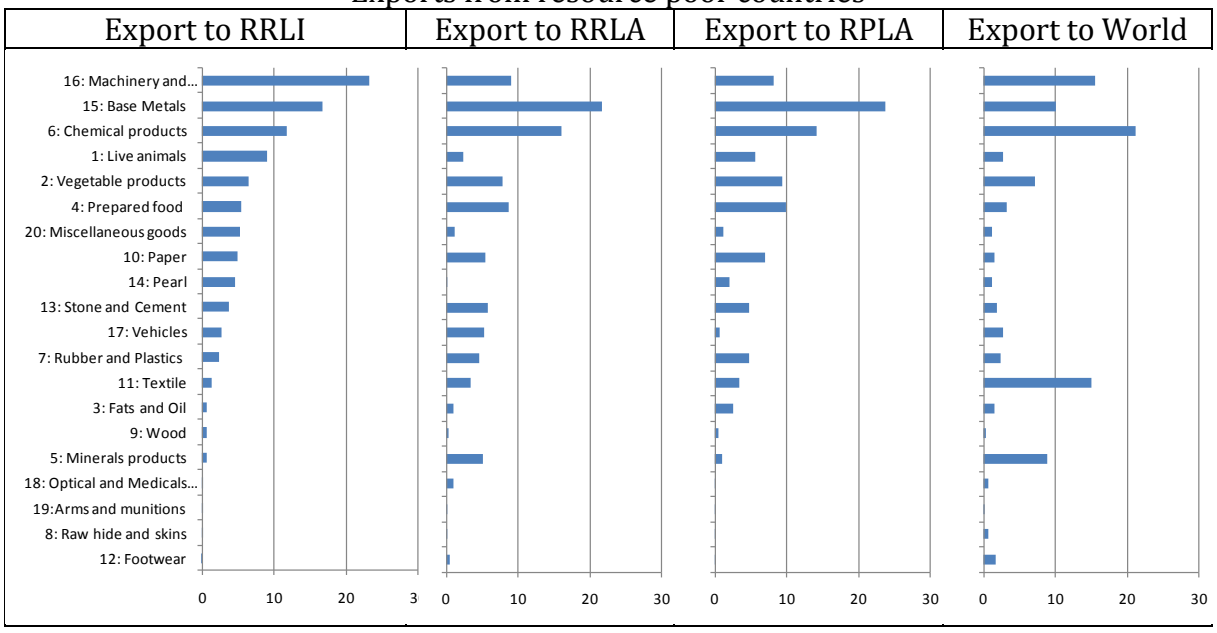
Predicted values: exponential of coefficients for trade diversion in table 4 col (2) and (4)

Figure 2
Regional distribution of export growth by sector
for resource rich and resource poor countries

Exports from resource rich countries



Exports from resource poor countries



Note: RRLA stands for resource rich labor abundant (i.e. developing oil exporter) countries, RRLI and resource rich labor importing (i.e. GCC oil exporter) countries and RPLA resource poor labor abundant countries.
Source: United Nations's Comtrade

Appendix: Agreements involving MENA countries as importer

Name	member countries	Coverage	Type	Date of notification	WTO Legal Cover	Date of entry into force
FTA intra-MENA						
Pan-Arab Free Trade Area (PAFTA)	Bahrain; Egypt; Iraq; Jordan; Kuwait; Lebanon; Libya; Morocco; Oman; Qatar; Saudi Arabia; Sudan; Syria; Tunisia; United Arab Emirates; Yemen	Goods	FTA	3-Oct-06	GATT Art. XXIV	1-Jan-98
Gulf Cooperation Council (GCC)	Bahrain; Kuwait; Oman; Qatar; Saudi Arabia; United Arab Emirates	Goods	CU	6-Oct-09	GATT Art. XXIV	1-Jan-03
AGADIR	Egypt; Jordan; Morocco; Tunisia	Goods		3-Oct-06	GATT Art. XXIV	1-Jan-04
Arab Magreb Union (UMA)	Algeria; Libya; Morocco; Tunisia; Mauritania	Goods				2-Jan-12
BTA intra-Mena (and not already included in intra-MENA FTAs above)						
Algeria-Jordan	Algeria-Jordan	Goods	FTA			2-Jan-02
FTA with non MENA countries						
Economic Cooperation Organization (ECO)	Afghanistan; Azerbaijan; Iran, Kazakhstan; Kyrgyz ; Pakistan; Tajikistan; Turkey; Turkmenistan; Uzbekistan	Goods	PTA	10-Jul-92	Enabling Clause	17-Feb-92
Common Market for Eastern and Southern Africa (COMESA)	Angola; Burundi; Comoros; Djibouti; Egypt (1999), Eritrea; Ethiopia; Kenya; Lesotho; Libya (2005); Madagascar; Malawi; Mauritius; Rwanda; Sudan; Swaziland; Tanzania; Uganda; Zambia; Zimbabwe	Goods	PTA	4-May-95	Enabling Clause	8-Dec-94
COMESA Free Trade	Burundi (2004); Comoros (2006); Djibouti; Egypt, Kenya; Libya (2006); Madagascar; Malawi; Mauritius; Rwanda (2004); Sudan; Zambia; Zimbabwe	Goods	FTA			22-Jun-00
Euromed Agreements						
EC Treaty	Austria (1995); Belgium; Bulgaria (2007); Cyprus(1995); Czech Republic (1995); Denmark (1973); Estonia (2004); Finland (1995); France; Germany; Greece (1981); Hungary (2004); Ireland (1973); Italy; Latvia (2004); Lithuania (2004); Luxembourg; Malta(2004); Netherlands; Poland (1995); Portugal (1986); Romania (2007); Slovak Republic (2004); Slovenia (2004); Spain (1986); Sweden (1995); United Kingdom (1973)	Goods	FTA	24-Jul-06	GATT Art. XXIV	1-Sep-05
EC - Algeria	EC - Algeria	Goods	FTA	24-Jul-06	GATT Art. XXIV	1-Sep-05
EC - Egypt	EC - Egypt	Goods	FTA	3-Sep-04	GATT Art. XXIV	1-Jun-04
EC - Jordan	EC - Jordan	Goods	FTA	17-Dec-02	GATT Art. XXIV	1-May-02
EC - Lebanon	EC - Lebanon	Goods	FTA	26-May-03	GATT Art. XXIV	1-Mar-03
EC - Morocco	EC - Morocco	Goods	FTA	13-Oct-00	GATT Art. XXIV	1-Mar-00
EC - Palestinian Authority	EC - Palestinian Authority	Goods	FTA	29-May-97	GATT Art. XXIV	1-Jul-97
EC - Syria	EC - Syria	Goods	FTA	15-Jul-77	GATT Art. XXIV	1-Jul-77
EC - Tunisia	EC - Tunisia	Goods	FTA	15-Jan-99	GATT Art. XXIV	1-Mar-98
FTA with EFTA						
European Free Trade	Iceland; Liechtenstein; Norway; Switzerland	Goods	FTA	30-Jan-70	GATT Art. XXIV	1-Mar-70
EFTA - Egypt	EFTA - Egypt	Goods	FTA	17-Jul-07	GATT Art. XXIV	1-Aug-07
EFTA - Jordan	EFTA - Jordan	Goods	FTA	17-Jan-02	GATT Art. XXIV	1-Jan-02
EFTA - Lebanon	EFTA - Lebanon	Goods	FTA	22-Dec-06	GATT Art. XXIV	1-Jan-07
EFTA - Morocco	EFTA - Morocco	Goods	FTA	20-Jan-00	GATT Art. XXIV	1-Dec-99
EFTA - Palestinian	EFTA - Palestinian Authority	Goods	FTA	23-Jul-99	GATT Art. XXIV	1-Jul-99
EFTA - Tunisia	EFTA - Tunisia	Goods	FTA	3-Jun-05	GATT Art. XXIV	1-Jun-05
EFTA - Turkey	EFTA - Turkey	Goods	FTA	6-Mar-92	GATT Art. XXIV	1-Apr-92
BTA with Turkey						
Turkey - Morocco	Turkey - Morocco	Goods	FTA	10-Feb-06	GATT Art. XXIV	1-Jan-06
Turkey - Palestinian Authority	Turkey - Palestinian Authority	Goods	FTA	1-Sep-05	GATT Art. XXIV	1-Jun-05
Turkey - Syria	Turkey - **Syria**	Goods	FTA	15-Feb-07	GATT Art. XXIV	1-Jan-07
Turkey - Tunisia	Turkey - Tunisia	Goods	FTA	1-Sep-05	GATT Art. XXIV	1-Jul-05
BTA with US						
US - Bahrain	US - **Bahrain**	Goods & Services	FTA & EIA	8-Sep-06	GATT Art. XXIV & GATS V	1-Aug-06
US - Jordan	US - Jordan	Goods & Services	FTA & EIA	15-Jan-02	GATT Art. XXIV & GATS V	17-Dec-01
US - Morocco	US - Morocco	Goods & Services	FTA & EIA	30-Dec-05	ATT Art. XXIV & GATS	1-Jan-06
US - Oman	US - **Oman**	Goods & Services	FTA & EIA	30-Jan-09	GATT Art. XXIV & GATS V	1-Jan-09